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CHICAGO, IL NETWORKING, STORAGE, & ANALYSIS

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SC26
Chicago, IL | hpc unites.

Introducing the SC26 Student Cluster Competitions

Abhinav Thota - SCC Chair

Steve Leak - SCC Connect Chair

Mohal Khandelwal - SCC Connect Vice Chair

Le Mai Weakley - SCC Vice Chair

Agenda

Today:

- About Student Cluster Competition (SCC) and SCC Connect
- SCC Components, Schedule, and Preparation
  - What's new this year?
- SCC Connect Components, Schedule, and Preparation
- How do you write a team application?
- Q&A

We're recording this session. The recording and slides will be posted on the SCC and SCC Connect pages.

Meet the committees

	SCC	SCC Connect
Chair	Abhinav Thota (IU)	Steve Leak (NERSC)
Vice Chair	Le Mai Weakley (IU)	Mohal Khandelwal (CU Boulder)
Infrastructure Chair	Stephen Bird (Notre Dame)	
App Leads	Laura Huber (IU)	Lev Gorenstein (Globus)
Benchmark Leads	Ryan DeRue (Purdue)	John Blaas (Lambda)
Cluster Operational Readiness Evaluation	Wajdi Halabi (Microsoft)	
Communication Leads		Sampson Akwafuo (CSU Fullerton)
Team Liaisons	Suzanna Gardner, William R. Scullin, Doug Smith	Nic Ventura, John Reiland, Pengfei Ding, Roger Karris, Chen-Chun Chen, Niklas Roemer
Lead Student Volunteers	Rahat Zaman (Utah)	Shadmaan Hye

- A whole bunch of other amazing volunteers!

What is the Student Cluster Competition (SCC)?

A 2-day, non-stop contest to build and run a (small) supercomputer

Teams of 6 undergraduate[1] students:

- Design and build a HPC Cluster
- Measure and tune its performance
- Run real science workloads on your cluster
- Handle real-world operational challenges
- Report on your results

All within power and noise limits

1. Student Team Members must:
   - Be enrolled in a university or high school
   - Be at least 18 years old by the beginning of the SCC
   - Not have received a bachelor's degree or equivalent before the beginning of the competition

What about SCC Connect?

Previously known as "IndySCC" - a virtual companion contest to the SCC

- Lower barrier to entry, especially for newer teams
- Teams compete using provided, cloud-based resources
  - Simpler logistics
- Most teams compete remotely
  - Some teams will be invited to compete from the SC26 exhibits floor
- Most competition elements are the same as SCC
  - Same applications, same or nearly-same tasks
  - Winning SCC Connect team receives Award at SC26 Awards ceremony

Why hold Student Cluster Competitions?

HPC is one of the best tools in existence for science and engineering

The student cluster competitions (SCC and SCC Connect) foster skill development and social connections to bring new people into HPC

SCC Components

- Benchmarks 📐 - get the highest score on the selected benchmark suite of HPL, HPL-MxP, MLPerf
- Applications 💻 - complete tasks and report results and performance
  - Weather Research & Forecasting Model (WRF): A state of the art mesoscale numerical weather prediction system designed for both atmospheric research and operational forecasting applications
  - Multi-Component Flow Code (MFC): An exascale compressible multiphase and multiphysics flow code.
- **NEW!** Cluster Operational Readiness Evaluation (CORE)
- Mystery Application 🔮 - announced at the beginning of the competition
- Team Poster 🤦

What's new this year?

SCC

- No Reproducibility Challenge Component
  - Replaced by “Cluster Operational Readiness Evaluation” (CORE)
- CORE
  - The SCC Committee will review the student clusters for operational readiness.
  - Think of a typical real-world, user-facing supercomputer that computing centers run. How does your cluster compare to them and how ready is it for hypothetical end users?
  - The evaluation can include the following areas: user and admin accounts, adding new users, job scheduler/management, cluster networking, security, monitoring, software environment management, etc.
  - A detailed grading rubric will be shared in the coming months.
- Checkout the SCC Rules - a lot of continuity from last year

What to expect: SCC Schedule

- Friday/ Saturday
  - Teams arrive 🛬🚆🚗
- Saturday
  - Afternoon: **Safety** briefings 👮, **Students@SC** Orientation 🧭 & Mixer 🥳
  - After the briefings: **building begins!** 👷
- Monday morning:
  - **Benchmarking** begins! 📐
  - At the end of benchmarking, **final configuration is locked** in 🔑 - no more hardware changes
- Monday evening:
  - **Mystery app, datasets announced** 🔓
  - **Main contest starts** 🏁
- Monday -> Wednesday
  - Teams run **applications** 💪, interact with conference goers, other events
- Wednesday evening:
  - **Competition ends!** 😌
- Thursday
  - Wrap up
  - Results announced at **Awards Ceremony!** 🏆

Preparation before the event:

- Teams form partnerships with institutions and vendors 🤝
- Design/build a cluster, practice building and running the applications 🏋️
- Plan logistics of getting to the competition 📝
- SCC provides for the 6 team members and 1 advisor:
  - Conference registrations 🎫
  - Single Occupancy Hotel Rooms 🛌
    - Conference provided hotel rooms cannot be shared with other attendees 🤷
- We encourage institution and vendor partners to cover other expenses
  - For example, travel 🛫, shipping 📦, and rideshares 🚕

SCC Connect Components

- Mostly the same as SCC!
- Benchmarks 📐 - get the highest score on the selected benchmark suite
- Applications 💻 - complete tasks and report results and performance
  - Weather Research & Forecasting Model (WRF): A state of the art mesoscale numerical weather prediction system designed for both atmospheric research and operational forecasting applications
  - Multi-Component Flow Code (MFC): An exascale compressible multiphase and multiphysics flow code.
- ~~Cluster Operational Readiness Evaluation (CORE)~~ SCC Only
- Mystery Application 🔮 - announced at the beginning of the competition (same App as SCC)
- Team Poster 💁

What to expect: SCC Connect

- 1-2 weeks before SC26 (probably*)
  - Benchmarking sessions
- Friday/ Saturday
  - Onsite teams arrive 🛬🚆🚗
  - Saturday Afternoon: **Safety** briefings 👮, **Students@SC** Orientation 🧭 & Mixer 🥳
- Sunday, Monday
  - SC Program (workshops and tutorials)
- Monday evening:
  - **Mystery app, datasets announced** 🔓
  - **Main contest starts** 🏁
- Monday -> Wednesday
  - Teams run **applications** 💪, interact with conference goers, other events
- Wednesday evening:
  - **Competition ends!** 😌
- Thursday
  - Wrap up
  - Results announced at **Awards Ceremony!** 🏆

* schedule not yet finalized

Learning and practice!

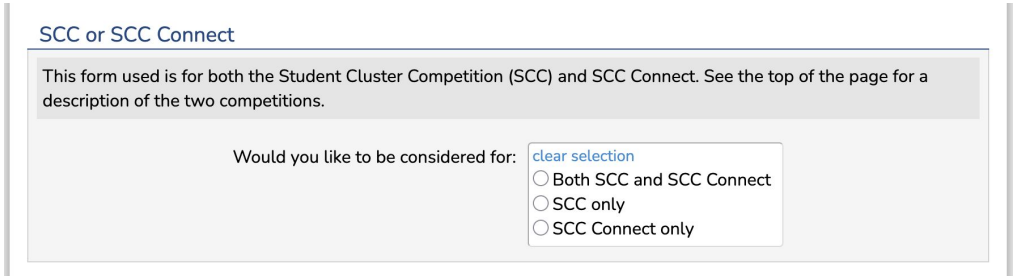
- Teams will get access to cloud-based practice resources during the summer
  - But don't wait until then!
  - Your institutional support is important here
    - Practice administering Linux systems, and building and running HPC applications, using your institution resources
      - (or an old laptop, or some raspberry pis, or ..)
    - 💡 Pro tip: look at applications listed on sc25.supercomputing.org, and other years, try building them
- Webinars, Q&A and Office hours in Summer and Fall
- Apps will have practice tasks
- In-person teams: make sure your travel is prepared early!

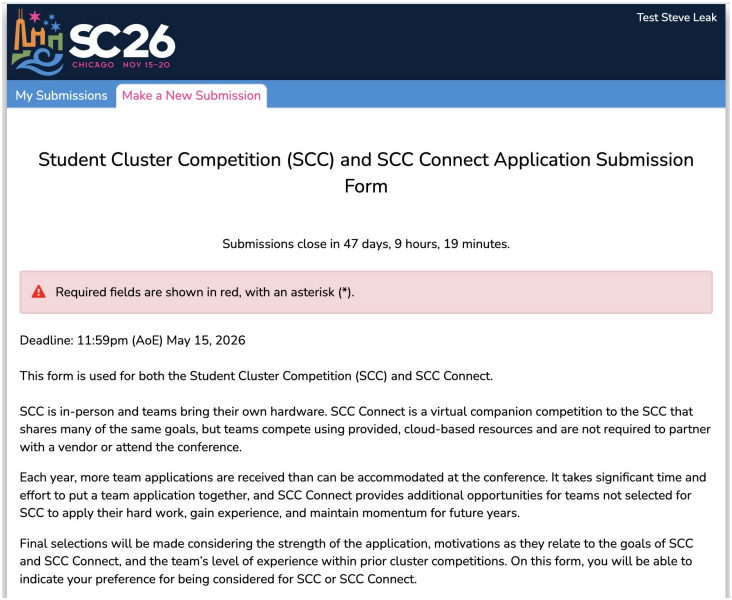
How to apply?

submissions.supercomputing.org

(There are links from SC26 webpage)

Use the same form for SCC and for SCC Connect





Tips for submitting your team application

SCC: This is a highly competitive contest, we will look for team cohesion, strong preparation, good support from your institution and vendors, deliberate effort to recruit from a diverse pool of possible team members. Some past experience in SCC, IndySCC or other student cluster competitions is a plus.

SCC Connect: Lack of HPC experience is fine! But we want to see good support from your institution, a strong preparation plan, and a motivated, cohesive team.

General tip: Read the questions! The blurbs are there to guide to towards a successful application.

More than the experience and knowledge of individual team members, we want to see a cohesive team that complements and supports each other.

Tell us how each of the team members will contribute to the overall success of your team.

Strength of Diversity

Humanity's greatest strength is our ability to collaborate widely and at scale. HPC, like many other STEM fields, is demographically tilted towards a small subset of the population. Increasing diversity benefits the field - more people, more collaboration - and lowers barriers to entry for more people.

But this doesn't happen automatically: we need to consciously make openings for more people to participate. So we want to see teams contributing to this effort in your team recruitment.

Look for who in your community is often overlooked for HPC roles, and find ways to bring them into your teams.

This is not required if you selected "SCC Connect only"

- Detail your hardware and software
  Go beyond technical specs and let us know how the specs will allow you to win
  - It's ok if your hardware changes a bit between now and SC26. We want to see that you have thought about your hardware design, and that your vendor is committed to providing hardware that will support it.
  - Pro tip: What is "plan B" for if your intended (GPU, etc) proves unobtainable?
- Why did you make the choices you did?

The dedication and enthusiasm of team members is vital, but you will need support from your institution!

We want to see evidence that your institution is committed to supporting you through the whole year, with eg:

- Mentoring
- Helping with resources for learning and practice
- Travel support as necessary
- Vendor engagement (SCC teams)

Preparation is a marathon, not a sprint!

We want to see a well-considered plan for preparation throughout the year

- How will your team learn and practice together?
- What practice exercises will you work on?
- Who amongst your institution and supporters will help you prepare, and how?
- Pro tip: don't just list a course catalog!

Team Educational Goals

Tell us about your motivations for participating

- As a team, and as individuals in the team

What are the skills, experience and connections you hope to build, in support of your longer-term goals?

Important Dates

March 2, 2026	SCC/SCC Connect Applications Open
May 15, 2026	SCC/SCC Connect Applications Close
June 19, 2026	Notifications sent to all teams

Q. Can my institution submit two teams, one to each contest?

A. Yes, but if we need to decide between two teams, we will prioritize including more institutions over a second team from the same institution

Got more questions?

SC26 SCC and SCC Connect Websites and Rules

- https://sc26.supercomputing.org/students/student-cluster-competition/
- https://sc26.supercomputing.org/students/scc-connect/

Email Us

- student-cluster-competition@info.supercomputing.org
- scc-connect@info.supercomputing.org